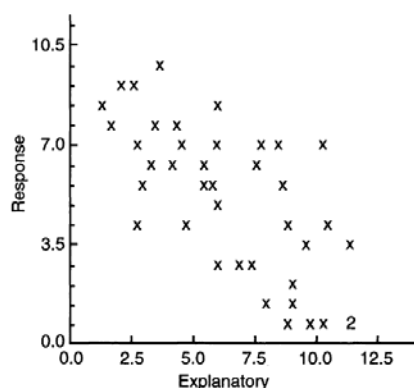


1. For the given scatterplot, what is the correct regression output?



(A)	Predictor	Coef	SE Coef	<i>T</i>	<i>P</i>
	Constant	9.1104	0.7745	11.76	0.000
	Explanatory	0.6181	0.1085	-5.70	0.000
	<i>S</i> = 2.02551	<i>R</i> -Sq = 46.1%	<i>R</i> -Sq(adj) = 44.7%		
(B)	Predictor	Coef	SE Coef	<i>T</i>	<i>P</i>
	Constant	9.1104	0.7745	11.76	0.000
	Explanatory	-0.6181	0.1085	-5.70	0.000
	<i>S</i> = 2.02551	<i>R</i> -Sq = 67.9%	<i>R</i> -Sq(adj) = 66.3%		
(C)	Predictor	Coef	SE Coef	<i>T</i>	<i>P</i>
	Constant	9.1104	0.7745	11.76	0.000
	Explanatory	0.6181	0.1085	-5.70	0.000
	<i>S</i> = 2.02551	<i>R</i> -Sq = 67.9%	<i>R</i> -Sq(adj) = 66.3%		
(D)	Predictor	Coef	SE Coef	<i>T</i>	<i>P</i>
	Constant	9.1104	0.7745	11.76	0.000
	Explanatory	-0.6181	0.1085	-5.70	0.000
	<i>S</i> = 2.02551	<i>R</i> -Sq = 46.1%	<i>R</i> -Sq(adj) = 44.7%		
(E)	Predictor	Coef	SE Coef	<i>T</i>	<i>P</i>
	Constant	-0.6181	0.7745	11.76	0.000
	Explanatory	9.1104	0.1085	-5.70	0.000
	<i>S</i> = 2.02551	<i>R</i> -Sq = 46.1%	<i>R</i> -Sq(adj) = 44.7%		

2. A magazine claims that 25.1% of all women enjoy gardening. A researcher believes the percentage is higher and performs a test of $H_0: p = 0.251$ versus $H_a: p > 0.251$. A random sample of 100 women yields significant results at the $\alpha = 0.05$ level. Which of the following statements about the confidence interval used to estimate the true population proportion of women who enjoy gardening must be true?
- (A) A 90% confidence interval contains the proportion 0.251.
- (B) A 90% confidence interval does not contain the proportion 0.251, because the value of 0.251 is above the upper limit of the interval.
- (C) A 90% confidence interval does not contain the proportion 0.251, because the value of 0.251 is below the lower limit of the interval.
- (D) A 95% confidence interval does not contain the proportion 0.251, because the value of 0.251 is above the upper limit of the interval.
- (E) A 95% confidence interval does not contain the proportion 0.251, because the value of 0.251 is below the lower limit of the interval.

3. Executives from a music label believe they are losing money from the number of CDs that individuals burn illegally. They would like to determine the number of CDs the average computer owner burns in a month. What size sample would they need to take to estimate this number with a margin of error of 0.5 with 95% confidence, if they assume the standard deviation is 3?
- (A) 10
 - (B) 17
 - (C) 24
 - (D) 98
 - (E) 139
4. As part of a statistics project, a student decides to find a 95% confidence interval for the difference in average ages of students and faculty. The student, through diligent research, is able to record the age of all faculty members and all students and then calculates the 95% confidence interval using the t -distribution. Which of the following is a consideration the student failed to take into account?
- (A) The group of teachers and students are not independent. Therefore, the assumptions for using the two-sample t -interval are not valid.
 - (B) The ages of teachers and students are not likely to be normally distributed. Therefore, the assumptions for using the two-sample t -interval are not valid.
 - (C) The distribution of student ages is likely to have a few large outliers. Therefore, the assumptions for using the two-sample t -interval are not valid.
 - (D) In both cases, the student had data for the entire population. Therefore, the actual difference in average ages can be computed, and a confidence interval is not valid.
 - (E) Because there are most likely 40 or more students and 40 or more faculty members, there is nothing the student failed to take into account, and the confidence interval is valid.

5. Randomly selected individuals were asked about their physical activity. Of 75 randomly selected men, 30 had walked for exercise in the preceding two weeks. Of 75 randomly selected women, 36 had walked for exercise in the preceding two weeks. Assume independence between the samples. Is there evidence to show a significant difference in the proportion of men and the proportion of women who walk for exercise?
- (A) Because the proportions are different, there is evidence to show a significant difference in the proportions of men and women who walk for exercise.
 - (B) With $p = 0.162$, there is insufficient evidence to show a significant difference in the proportions of men and women who walk for exercise.
 - (C) With $p = 0.324$, there is insufficient evidence to show a significant difference in the proportions of men and women who walk for exercise.
 - (D) With $p = 0.838$, there is insufficient evidence to show a significant difference in the proportions of men and women who walk for exercise.
 - (E) The conditions necessary to perform a significance test have not been met; therefore, a conclusion cannot be drawn.
6. Which of the following is a true statement about experimental design?
- (A) Replication is a key component in experimental design. Thus, an experiment needs to be conducted on repeated *samples* before generalizing results.
 - (B) Control is a key component in experimental design. Thus, a control group that receives a placebo is a *requirement* for experimentation.
 - (C) Randomization is a key component in experimental design. Randomization is used to *reduce* bias.
 - (D) Blocking eliminates the effects of *all* lurking variables.
 - (E) The placebo effect is a concern for *all* experiments.

7. An experimenter believes that two new exercise programs are more effective than any current exercise routines and wishes to compare the effectiveness of these two new exercise programs on physical fitness. The experimenter is trying to determine whether or not a control group, which follows neither of these new programs but continues with current exercise routines, would be beneficial. Which of the following can be said about the addition of a control group?
- (A) A control group would eliminate the placebo effect.
 - (B) A control group would eliminate the need for blinding in the study.
 - (C) A control group would allow the experimenter to determine which of the two exercise programs improves physical fitness the most.
 - (D) A control group would allow the experimenter to determine if either of the exercise programs is more effective than current programs for physical fitness.
 - (E) There would be no added benefit to having a control group.
8. A large fast-food chain is changing vendors for its children's meal toys. The vendor claims that equal quantities of the four types of toys have been manufactured and will be distributed randomly among the restaurants. One restaurant received 89 of one type of toy, 95 of a second type, 106 of a third type, and 110 of the fourth type of toy in a shipment of 400 toys. If we consider this shipment to be a random sample of toys, does this shipment provide sufficient evidence to contradict the vendor's claim?
- (A) Yes, since the store did not receive 100 of each type of toy.
 - (B) Yes, since a test of significance yields significant results at the 0.10 but not at the 0.05 level.
 - (C) Yes, since a test of significance yields significant results at the 0.05 but not at the 0.01 level.
 - (D) Yes, since a test of significance yields significant results at the 0.01 but not at the 0.001 level.
 - (E) No, since a test of significance yielded results that were not significant at even the 0.10 level.
9. Concert attendance for a stadium is normally distributed with a standard deviation of 7641. If a concert with 41,293 people in attendance is in the top 2% of all concert attendance records, what is the mean concert attendance?
- (A) 25,601
 - (B) 27,917
 - (C) 54,670
 - (D) 56,986
 - (E) 77,163

10. A congressman mails a questionnaire to his constituents asking if the United States should use military force to overthrow violent dictators in controversial areas of the world. Of the 500 people who respond, 35% believe the United States should use military force in this situation. On a talk show, the politician claims that only 35% of his constituents (with a 4% margin of error) believe in using military force. Which assumption for constructing a confidence interval is violated?
- (A) The population is ten times as large as the sample.
 - (B) The data constitute a simple random sample from the population of interest.
 - (C) The count of successes, $n\hat{p}$, is 10 or more.
 - (D) The count of failures, $n(1 - \hat{p})$, is 10 or more.
 - (E) There are no violations for constructing a confidence interval.
11. Owners of a day-care chain wish to determine the proportion of families in need of day care for the town of Bockville. Bockville is estimated to have 1000 families. The owners of the day-care chain randomly sample 50 families and find that 60% of them have a need for day-care services. Which of the following is a condition necessary for constructing a confidence interval for a **proportion** that has *not* been met?
- (A) The data constitute a representative random sample from the population of interest.
 - (B) The sample size is less than 10% of the population size.
 - (C) The counts of those who need day care and those who don't need day care are 10 or more.
 - (D) The distribution of sample values is approximately normally distributed.
 - (E) All conditions necessary for constructing a confidence interval for the proportion seem to be met.

12. Which of the following sample designs does *not* contain a source of bias?

- (A) A politician would like to know how her constituents feel about a particular issue. As a result, her office mails questionnaires about the issue to a random sample of adults in her political district.
- (B) A company uses the telephone directory to randomly select adults for a telephone survey to gauge their feelings toward items manufactured by the company.
- (C) An interviewer selects a random sample of individuals to question about a particular issue. Since some of the individuals are not informed about the issue, the interviewer gives background and his personal view on the issue before recording their responses.
- (D) A news show asks viewers to call a toll-free number to express their opinions about a recent high-publicity trial.
- (E) One thousand numbered tickets are sold as a fund-raiser. Five numbers are chosen randomly, and the individuals with the winning ticket numbers each win \$10.

13. The cause of death and the age of the deceased are recorded for 440 patients from a hospital.

	15–24	25–34	35–44	45–54	55–64	Total
Accident	14	12	15	12	7	60
Homicide	5	4	3	0	0	12
Heart disease	1	3	14	34	63	115
HIV	0	3	6	4	0	13
Cancer	2	4	17	47	89	159
Other	3	7	16	26	43	95
Total	25	33	71	123	202	440

Use these values to estimate the probability that a person at this hospital died as a result of an accident if it is known the person was between the ages of 45 and 54.

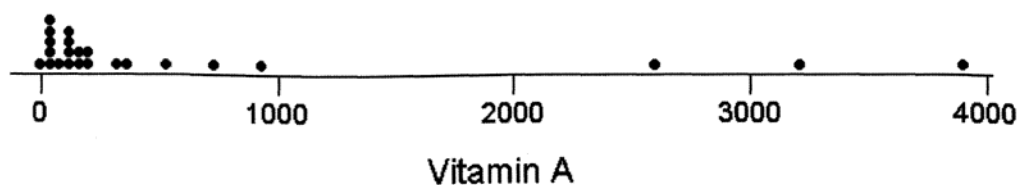
- (A) 0.0273
- (B) 0.0976
- (C) 0.1364
- (D) 0.2000
- (E) 0.4878

14. Two different Internet sites claim to offer the Web's lowest hotel rates for major U. S. cities. To test the claim, a consumer group randomly selects 50 hotels, and checks the rate charged for these hotels on both sites. To determine if there is a significant difference in rates between these two sites, which significance test is appropriate?
- (A) Two-sample z -test
 - (B) Two-sample t -test
 - (C) Matched-pairs test
 - (D) χ^2 test of independence
 - (E) Linear regression t -test
15. Which of the following does *not* represent a probability density function?
- (A) $f(x) = 1$ for $0 \leq x \leq 1$
 - (B) $f(x) = \frac{1}{3}x$ for $0 \leq x \leq \sqrt{6}$
 - (C) $f(x) = \frac{1}{4}x + \frac{1}{4}$ for $0 \leq x \leq 2$
 - (D) $f(x) = \begin{cases} 0.2, & 0 \leq x \leq 3 \\ 0.4, & 3 < x \leq 4 \\ 0, & \text{elsewhere} \end{cases}$
 - (E) $f(x) = \begin{cases} 0.1, & 0 \leq x \leq 8 \\ 0.2, & 8 < x \leq 10 \\ 0, & \text{elsewhere} \end{cases}$
18. A drug company wishes to test a new drug. A researcher assembles a group of volunteers and randomly assigns them to one of two groups—one to take the drug and one to take a placebo. In addition, the company wants the experiment to be double-blind. What is the meaning of double-blind in this situation?
- (A) The volunteers in both groups are blindfolded when they take the drug or placebo.
 - (B) The volunteers in both groups do not know whether they are taking the drug or the placebo.
 - (C) Neither the volunteers nor the drug company executives know which volunteers are taking the drug and which are taking the placebo.
 - (D) Neither the volunteers nor the evaluator know which volunteers are taking the drug and which are taking the placebo.
 - (E) As long as the subjects are randomly assigned to the two groups, there is no need to make the experiment double-blind.

19. A baseball recruiter visits a high school where a player has a batting average of 0.450. (This means that he gets a hit in 45% of his at-bats.) What is the probability that the recruiter won't see the player get a hit until his third at-bat?

- (A) $(0.450)^2(0.550)$
- (B) $(0.550)^2(0.450)$
- (C) $\binom{3}{1}(0.450)(0.550)^2$
- (D) $\binom{3}{1}(0.550)(0.450)^2$
- (E) $\binom{3}{2}(0.450)(0.550)^2$

20. The following graph shows the vitamin A content (in IUs, International Units) for 23 types of fruit.



Which of the following would be the best measure to describe the center of this distribution?

- (A) Mean
- (B) Median
- (C) Standard deviation
- (D) Interquartile range
- (E) Range